

## A new genus and species of Buccinidae (Mollusca: Gastropoda) from the Continental Slope of eastern and southern Australia

By **W.F. Ponder**,  
The Australian Museum, Sydney

### ABSTRACT

A new genus and species, *Kapala kengrahami*, are introduced for a peculiar buccinid from deep-water off the New South Wales coast and the Great Australian Bight. The gross anatomy as well as the shell, radular and opercular features are described.

### INTRODUCTION

Trawling operations by the New South Wales State Fisheries vessel FRV *Kapala* have obtained an excellent collection of molluscs from the continental slope of N.S.W. Amongst these were several shells of a peculiar buccinid which was obviously a new species but it was decided to delay description until preserved material was obtained. Specimens collected by the Danish research vessel *Galathea* in the Great Australian Bight were recognized as this new species by Dr. Anders Warén and forwarded from Copenhagen. These specimens are preserved in alcohol and, although their preservation is not excellent it is more than sufficient to determine the basic anatomy of this species.

### TAXONOMY

Genus *Kapala* gen. nov.

Type species: *Kapala kengrahami* sp. nov.

Shell pagodiform to broadly fusiform, with broadly channelled or strongly shouldered whorls, fine spiral sculpture and weak axial ribs on early whorls. Anterior canal short, curved, weakly-notched or simple; fasciole very weak; inner lip a thin glaze, out lip thin. Protoconch dome-shaped, of about 3 whorls, nucleus minute. Radula with central teeth weak, broad, with 1 or 3-4 small cusps; lateral teeth with massive outer cusp, short inner cusp and 3-4 small, intermediate cusps. Operculum oval, nucleus at blunt apex. Penis large, with long, slender (retractile?) distal filament. Salivary gland ducts embedded in anterior oesophageal wall within proboscis.

Remarks. The type species of the new genus differs from other buccinids in having the following combination of characters:— a multispiral protoconch, a short, twisted siphonal canal and a long, (retractile?) penial appendage. It appears to be allied to the *Penion-*

*Buccinulum-Neptunea* stock in having the salivary ducts embedded in the wall of the anterior oesophagus and in having a terminal nucleus on the operculum. One genus to which it may be related is *Antarctoneptunea* Dell, 1972 but the type species of that genus, *Fusitriton aurora* Hedley, 1916, has only weakly convex whorls with normal sutures, and, although the protoconch is multispiral, it is relatively very large. *Cavineptunea*. Powell, 1951, another monotypic Antarctic genus based on *C. monstrosa* Powell, 1951, appears to differ from *A. aurora* in only its protoconch characters, the radular features being essentially similar (Powell, 1951, fig. K, 68; Dell, 1972, fig. 6). The protoconch of *Cavineptunea* consists of a tall, spirally wound collar surrounding a deep apical cavity, the nucleus small and central. The teleoconch characters in the two species are very similar. The shell of *Kapala* differs from both these "genera" in having a relatively much smaller protoconch, deeply impressed sutures which are usually channelled and distinct axial sculpture on the upper whorls of the teleoconch. The radula has non-thickened central teeth with very reduced cusps and the lateral teeth have a massive outer cusp and short inner cusp with 3-4 small cusps between. *Antarctoneptunea aurora* and *C. monstrosa* both have a relatively narrower, squarer central tooth with prominent cusps and the inner cusp of the lateral teeth is about half the length of the outer cusp. There is one long intermediate cusp in *A. aurora* and 1-2 small cusps in *C. monstrosa*.

*Chlanificula* Powell, 1958, another monotypic Antarctic genus, resembles *Kapala* more closely in teleoconch features than any other genus but differs in having stronger spiral sculpture and a more strongly twisted canal. It resembles *Kapala* in having a broadly ovate shell, a short canal with a weak fasciole and (narrowly) channelled sutures. Unfortunately this genus was described on a single empty shell which did not have an intact protoconch. Until the radular and protoconch features of *Chlanificula thielei* Powell, 1958 are determined its relationship with *Kapala* must remain in doubt.

*Kapala kengrahami* sp. nov. Figs 1-9, pl. 1, figs 1-5.

*Shell*: (pl. 1, figs 1-5). Large, thin to moderately solid, pagodiform to broadly fusiform, with fine spiral lirae and broadly channelled sutures. Protoconch (fig. 3) dome-shaped, of 3 smooth, convex whorls, first whorl minute. Teleoconch of up to about 8 whorls, with rounded shoulders and, in nearly all specimens, a deep, wide subsutural excavation; lower half of whorls very lightly concave, base lightly convex. Sculpture of teleoconch of fine, close, spiral lirae crossed by close, inconspicuous axial striae and weak to moderate axial folds on first 3-4 whorls. Aperture relatively large in small specimens, relatively small in large specimens, narrow, produced into a short, broadly open, slightly twisted, weakly notched to simple, anterior canal. Inner lip thin, a thin callus on parietal wall; out lip thin; simple in all available specimens. Fasciole weak to absent. Periostracum thin, yellowish, easily worn off; with short, narrow lamellate processes at points of intersection of spiral and axial shell sculpture.

	Length	diameter
Shell dimensions: Holotype:	73.3 mm	48.5 mm
Paratypes (C100797)	93.0	47.5
(C100823)	77.0	45.0
Paratypes, Zool. Mus. Copenhagen (♂)	51.7	30.7
(♂)	42.5	28.5
(♀)	60.0	37.2

*Operculum*: (fig. 1) horny, thin, elongately oval with terminal nucleus and prominent growth lines. Apical end truncate.

*Radula*: (figs 4, 9) central teeth large, thin, with broad base, a small, weak primary cusp; a pair of minute secondary cusps in one specimen (fig. 4), and none in the other (fig. 9). Lateral teeth heavy, with massive, sharp outer cusp, a short inner cusp and 3-4 small intermediate cusps.

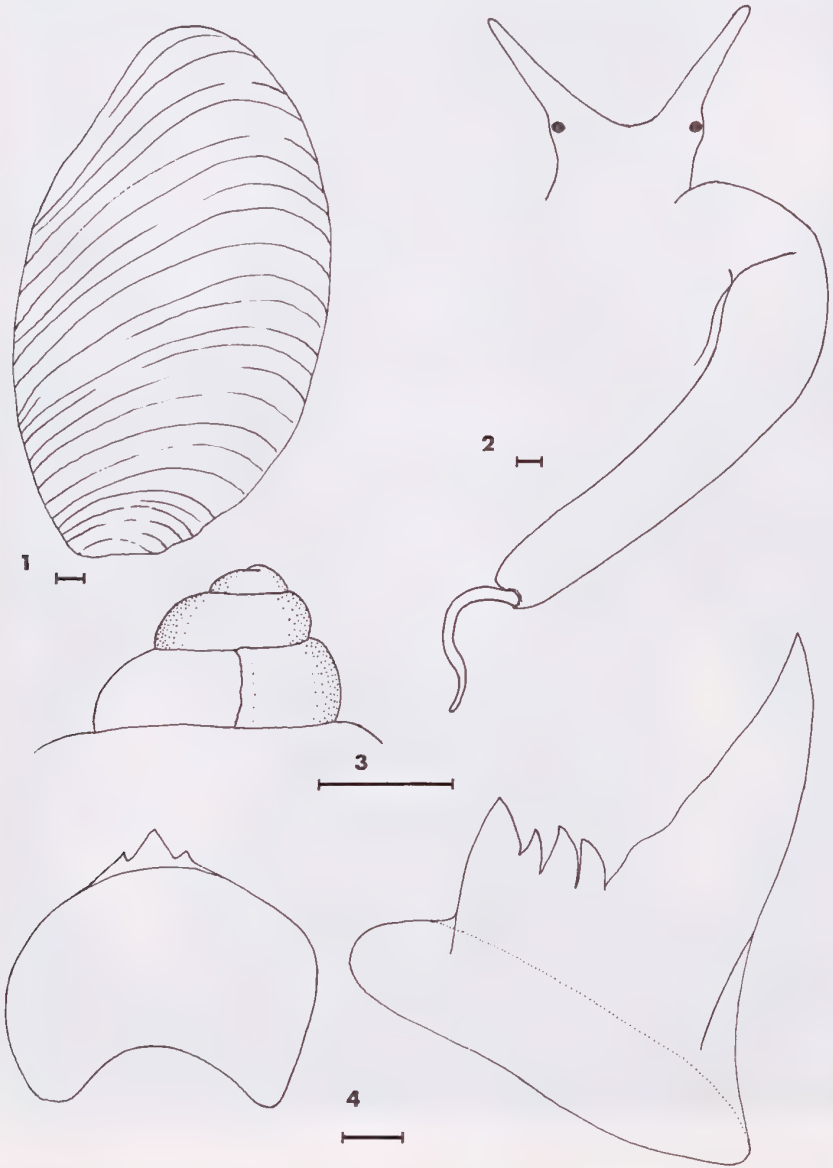
*Anatomy*: (figs 2, 5-8). Foot (fig. 5, f) relatively small, with well defined propodial groove; operculum (fig. 5, op) relatively large, much of under-surface exposed. Head small (figs 2,



Plate 1

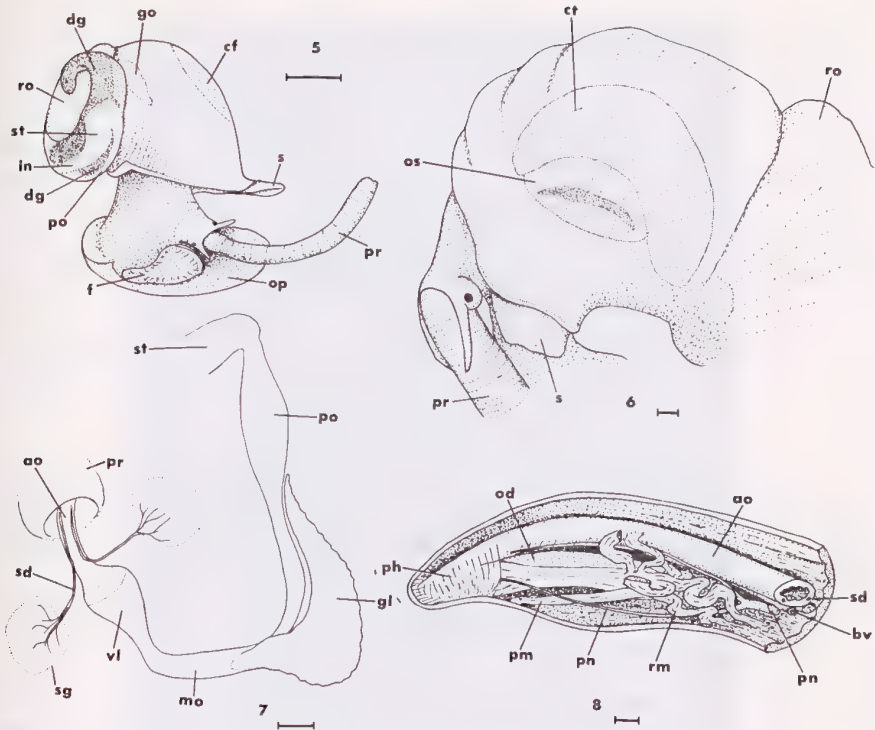
Figs 1-5. *Kapala kengrahami*. Holotype and paratypes 1. Paratype, C.100857. 2. Holotype. 3. Paratype, C.100797. 4-5. Paratypes, Galathea station 554.

5) with well developed eyes at the bases of a pair of short tentacles. Proboscis (fig. 5, pr) extruded from all specimens, 3.8 cm in length in largest specimen (total length to base of proboscis sac 4.5 cm). Ctenidium (fig. 6, ct) large, brown, with broadly triangular filaments. Osphradium (fig. 6, os) dark brown, large, oval, bipectinate. Siphon (figs 5, 6, s) short, muscular. Hypobranchial gland not preserved. Proboscis sac large, thin-walled, proboscis retractor muscles well developed. Jaws absent, pharynx (fig. 8, ph) short. Odontophore (fig. 8, od) and radula relatively small, radular sac wholly contained within odontophore.



Figures 1-4. 1. Operculum. 2. Penis. 3. Protoconch (holotype). 4. Radular teeth (central and right lateral teeth). Figures 1, 2, 4 from *Galathea* specimens. Scale = 1 mm for all figures except fig. 4 (= 0.1 mm).





Figures 5-8. 5. Female removed from shell. 6. Left side of the animal to show disposition of the pallial structures. 7. Alimentary canal from the base of oesophagus to the stomach. 8. Lateral view of anterior end of proboscis showing the buccal mass. Scale = 1 mm for all figures except fig. 5 (= 10 mm).

Anterior oesophagus (figs 7, 8 ao) simple, with narrow salivary ducts (fig. 8, sd) embedded in its latero-ventral wall. Interior of anterior oesophagus with several low, longitudinal ridges. Salivary ducts narrow, entering oesophageal wall at base of proboscis sac (fig. 7). Salivary glands (fig. 7, sg) large, loose, in posterior cephalic cavity. Valve of Leiblein (fig. 7, vl) rather large, with nerve ring immediately behind. Mid-oesophagus (fig. 7, mo) short, rather broad except where it passes through nerve ring. Gland of Leiblein (fig. 7, gl) dark brown, elongate, opening anteriorly into oesophagus. Posterior oesophagus (fig. 7, po) simple, about same width or slightly narrower than mid-oesophagus in cephalic cavity; expands and walls thicken to form muscular, crop-like structure behind cavity. It opens at posterior end of rather small, simple stomach. Intestine emerges from anterior end of stomach and rectum passes down right side of mantle cavity in usual way. No anal gland found. Kidney (fig. 5, ro) very large and interior filled with long lamellae.

Males (shells 42.5 mm and 51.7 mm in length) have large, parallel-sided penis (fig. 2) behind right eye. Penis with long, slender (retractile?), distal papilla. Smaller specimen examined internally has narrow ejaculatory duct running from base of penis on right side of head to small prostate gland at base of pallial cavity. This opens to a short, swollen, thick-walled renal deferens which becomes a long, coiled vas deferens.

Female (shell 60 mm in length) with moderately well-developed pallial oviduct divided into small posterior albumen gland about  $\frac{1}{4}$  length of pallial duct, a larger capsule gland and a short, muscular terminal vagina. No ingesting gland observed, probably due to immaturity of material.



Figure 9. Radular teeth of paratype (*Galathea* specimen). Scale = 20  $\mu$ m.

#### Abbreviations used in figures 5-8.

ao, anterior oesophagus; bv, blood vessel; ct, ctenidium; dg, digestive gland; f, foot; gl, gland of Leiblein; go, glandular pallial oviduct; in, intestine; mo, mid-oesophagus; od, odontophore; op, operculum; os, osphradium; ph, pharynx; pm, odontophore protractor muscle; pn, proboscis nerve; po, posterior oesophagus; pr, proboscis; rm, odontophore retractor muscle; ro, renal organ (kidney); s, siphon; sd, salivary duct; sg, salivary gland; st, stomach; vl, valve of Leiblein.

#### TYPE MATERIAL

Holotype: 20 miles E of Kiama, N.S.W., 34°36-45'S, 151°16-13'E, 503 m, 21 Aug. 1975. Mud bottom, prawn trawl; F.R.V. *Kapala* stn K75-05-08. AMS\*, C.100857..

Paratypes: E of Kiama, N.S.W., 34°38-46'S, 151°15-13'E, 457-439 m., 30 June 1975. Prawn trawl; F.R.V. *Kapala* stn K75-02-17. 1 shell, AMS, C.100797. Off Broken Bay, N.S.W., 33°25-30'S, 153°03-07'E, 640 m, 19 Aug. 1975. Mud bottom, otter trawl; F.R.V. *Kapala* stn K75-05-

04. 1 shell, AMS, C.100823. Off Port Stephens, N.S.W., 32°50-52'S, 152°42-41'E., 550 m, 6 Dec. 1978. F.R.V. *Kapala* stn K78-26-11. 1 shell, AMS, C.120404. Great Australian Bight, 37°28'S, 138°55'E, 1330 m, 5 Dec. 1951. *Gobigerina* ooze; *Galathea* (1950-52 Exped.) stn 554. 6 specimens, Zoological Museum, Copenhagen.

Other material examined. Off Nowra, N.S.W., 448 m, 1 shell. H. Ford colln. E. of Brush Island, N.S.W., 35°32-35'S, 150°46-44'E, 503 m, 22 Nov. 1977. F.R.V. *Kapala* stn K.77-21-05; 1 broken shell, AMS, C110720. Off Wollongong, N.S.W., 34°22-19'S, 151°23-25'E, 439 m, 4 Dec. 1978. F.R.V. *Kapala* stn K.78-27-16. 1 internal mould of a juvenile, AMS.

Remarks. The new species cannot be confused with any other in the Australasian area. It most nearly resembles *Chlanificula thielei* Powell, 1958 from the Antarctic as discussed above.

This species is named for Mr. Ken Graham of N.S.W. State Fisheries who has been responsible for collecting most of the specimens.

\* Footnote: AMS — The Australian Museum, Sydney.

### ACKNOWLEDGEMENTS

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### REFERENCES

- Dell, R.K., 1972. A new genus of Antarctic buccinid gastropod. *Rec. Dom. Mus. Wellington*, 8 (7): 115-119.
- Powell, A.W.B., 1951. Antarctic and Subantarctic Mollusca: Pelecypoda and Gastropoda. *Discov. Repts*, 26: 47-196.
- \_\_\_\_\_ 1958. Mollusca from the Victoria-Ross Quadrants of Antarctica. *B.A.N.Z.A.R. Exped. Rept. B.*, 6: 165-213.